Rock Island Arsenal Safety and Occupational Health Council

William C. Brown
SMARI-SF
DSN 793-1380
brownw@ria.army.mil

OSC - On The Line

Briefing Agenda

- Commander's Opening Comments
- Purpose of SOHC
- Current Safety Performance
- Status of Computer Based Safety Training
- Safety After Accident Review
- Fire In Dust Collector
- Issues from the Council

Purpose of Safety and Occupational Health Council

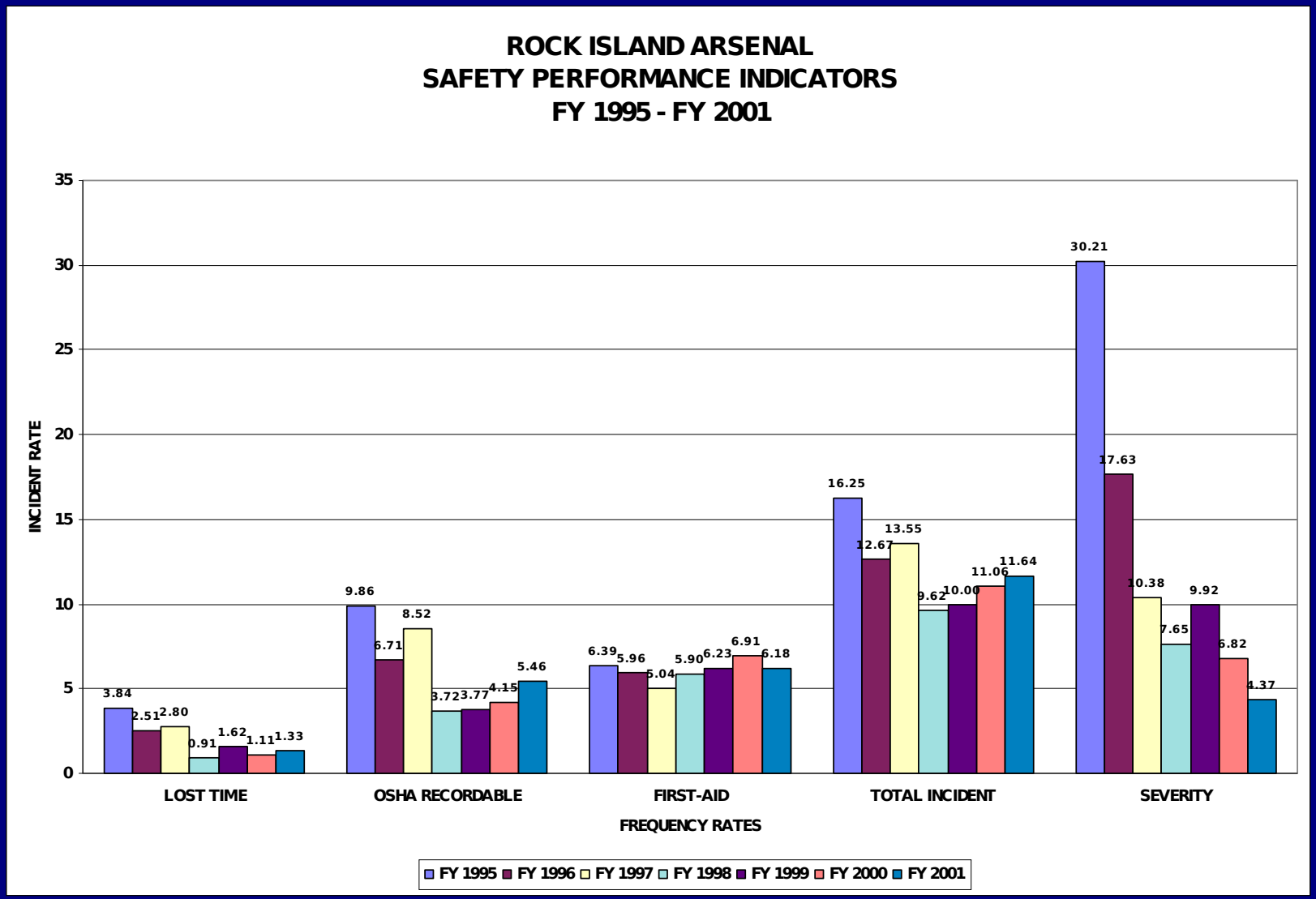
- Forum to Evaluate Safety and Occupational Health Program Status
- Review Safety and Occupational Health Performance
- Forum to Address Major Issues

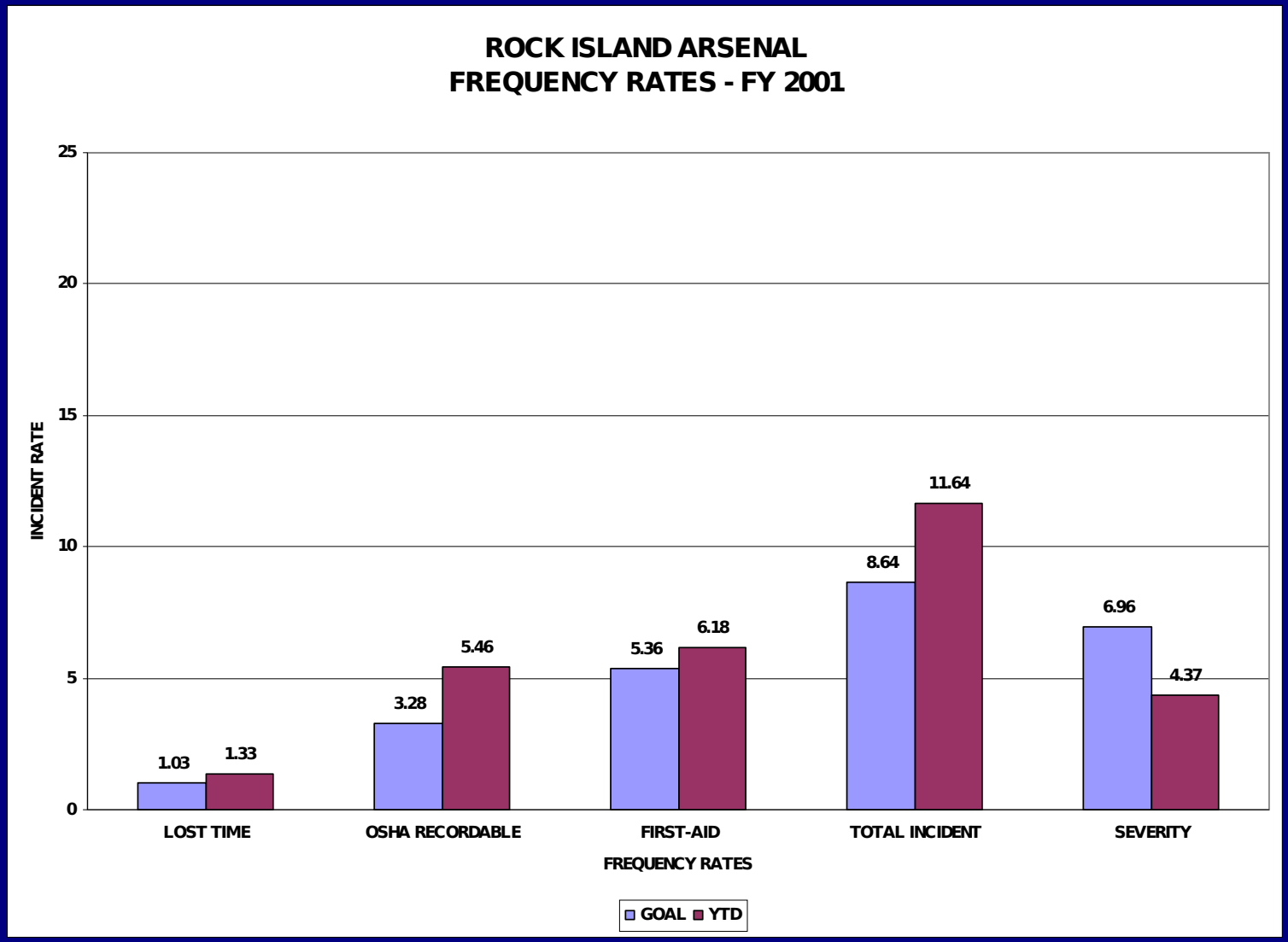
Current Safety Performance

Jerry Golden
SMARI-SF
DSN 793-1380
goldenj@ria.army.mil

RIA Cases and Frequency Rates YTD JUL FY 2001

CASES	FY 1995	FY 1996	FY 1997	FY 1998	FY 1999	FY 2000	FY 2001
LOST TIME	72	43	45	13	21	12	11
OSHA RECORDABLE	185	115	137	53	49	45	45
FIRST-AID	120	102	81	84	81	75	51
TOTAL	305	217	218	137	130	120	96
LOST WORKDAYS	567	302	167	109	129	74	36
HOURS OF EXPOSURE	3,753,449	3,425,361	3,217,248	2,848,611	2,600,009	2,169,852	1,649,365
FREQUENCY RATES	FY 1995	FY 1996	FY 1997	FY 1998	FY 1999	FY 2000	FY 2001
LOST TIME	3.84	2.51	2.80	0.91	1.62	1.11	1.33
OSHA RECORDABLE	9.86	6.71	8.52	3.72	3.77	4.15	5.46
FIRST-AID	6.39	5.96	5.04	5.90	6.23	6.91	6.18
TOTAL INCIDENT	16.25	12.67	13.55	9.62	10.00	11.06	11.64
SEVERITY	30.21	17.63	10.38	7.65	9.92	6.82	4.37


ROCK ISLAND ARSENAL
SAFETY PERFORMANCE INDICATORS
FY 1995 - FY 2001
INCIDENT RATE
35
30
25
20
15
10
5
0
3.84
2.51
2.80
0.91
1.62
1.11
1.33
9.86
6.71
8.52
3.72
3.77
4.15
5.46
6.39
5.96
5.04
5.90
6.23
6.91
6.18
16.25
12.67
13.55
9.62
10.00
11.06
11.64
30.21
17.63
10.38
7.65
9.92
6.82
4.37
LOST TIME
OSHA RECORDABLE
FIRST-AID
TOTAL INCIDENT
SEVERITY
FREQUENCY RATES
FY 1995
FY 1996
FY 1997
FY 1998
FY 1999
FY 2000
FY 2001

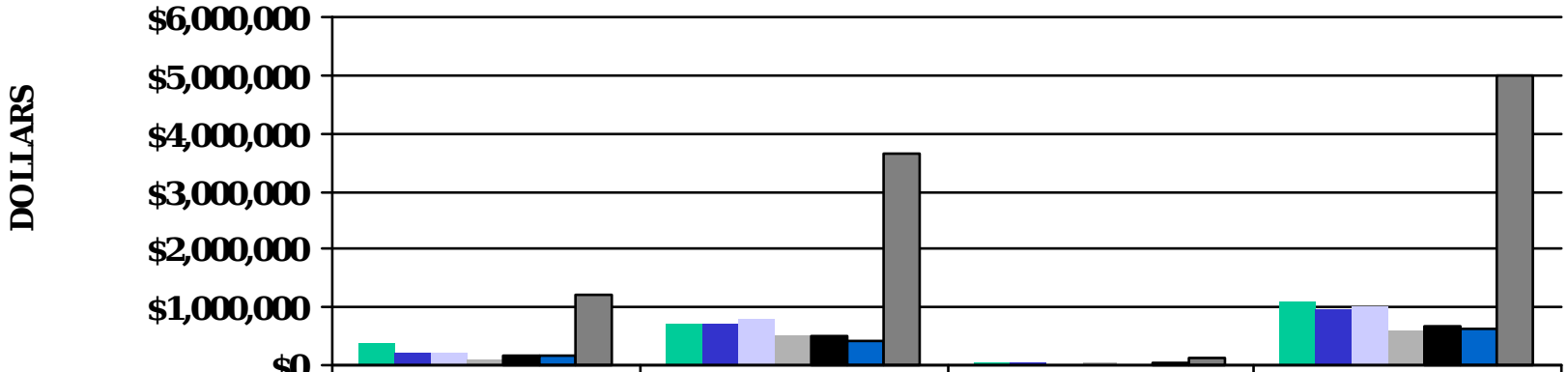

ROCK ISLAND ARSENAL
FREQUENCY RATES - FY 2001
INCIDENT RATE
25
20
15
10
5
0
1.03
1.33
3.28
5.46
5.36
6.18
8.64
11.64
6.96
4.37
LOST TIME
OSHA RECORDABLE
FIRST-AID
TOTAL INCIDENT
SEVERITY
FREQUENCY RATES
GOAL
YTD

Rock Island Arsenal
+/- Goal Status

DESCRIPTION	COST CENTER	+/- GOAL LOST TIME	+/- GOAL SHA RECORDABL	+/- GOAL FIRST-AID	+/- GOAL TOTAL INCIDENT	+/- GOAL SEVERITY
RIA	01000-Z8000	29%	66%	15%	35%	-37%
SMARI-CO	01000	-100%	-100%	-100%	-100%	-100%
SMARI-HD	02000	-100%	-100%	-100%	-100%	-100%
SMARI-GC	03000	-100%	-100%	-100%	-100%	-100%
SMARI-IA	04000	-100%	-100%	-100%	-100%	-100%
SMARI-CA	05000	-100%	-100%	-100%	-100%	-100%
SMARI-EO	06000	-100%	-100%	-100%	-100%	-100%
SMARI-SF	07000	-100%	-100%	-100%	-100%	-100%
SMARI-QM	08000	-100%	-100%	-100%	-100%	-100%
SMARI-RM	11000	-100%	-100%	-100%	-100%	-100%
SMARI-CT	12000	-100%	100%	-100%	76%	-100%
SMARI-PW	13000	-100%	-100%	19%	-57%	-100%
SMARI-PC	14000-14300	-100%	100%	120%	341%	-100%
SMARI-LE	15000	85%	11%	-100%	-54%	-70%
SMARI-SM	16000	-100%	-100%	-100%	-100%	-100%
SMARI-IC	50000-59600	46%	82%	28%	49%	-21%
SMARI-ES	60000-64000	-100%	-100%	114%	2%	-100%
SMARI-IT	E0000-E7000	-100%	70%	-27%	2%	-100%
SMARI-AP	L0000	-100%	-100%	-100%	-100%	-100%
SMARI-CF	Z0000-Z8000	100%	693%	-25%	135%	100%

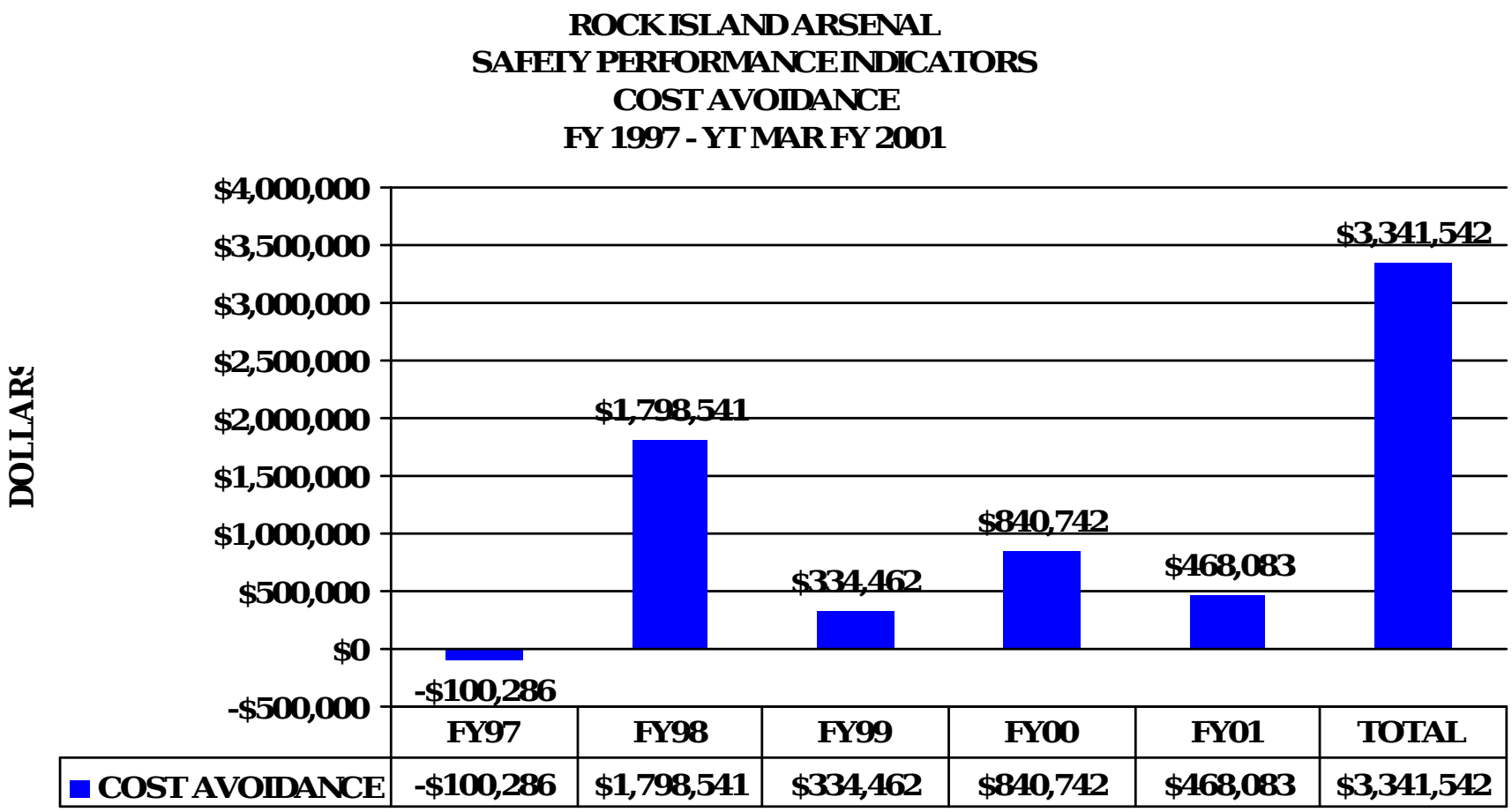
Current Safety Performance

ROCK ISLAND ARSENAL
SAFETY PERFORMANCE INDICATORS
COSTS
FY 1996 - YTD MAR FY 2001

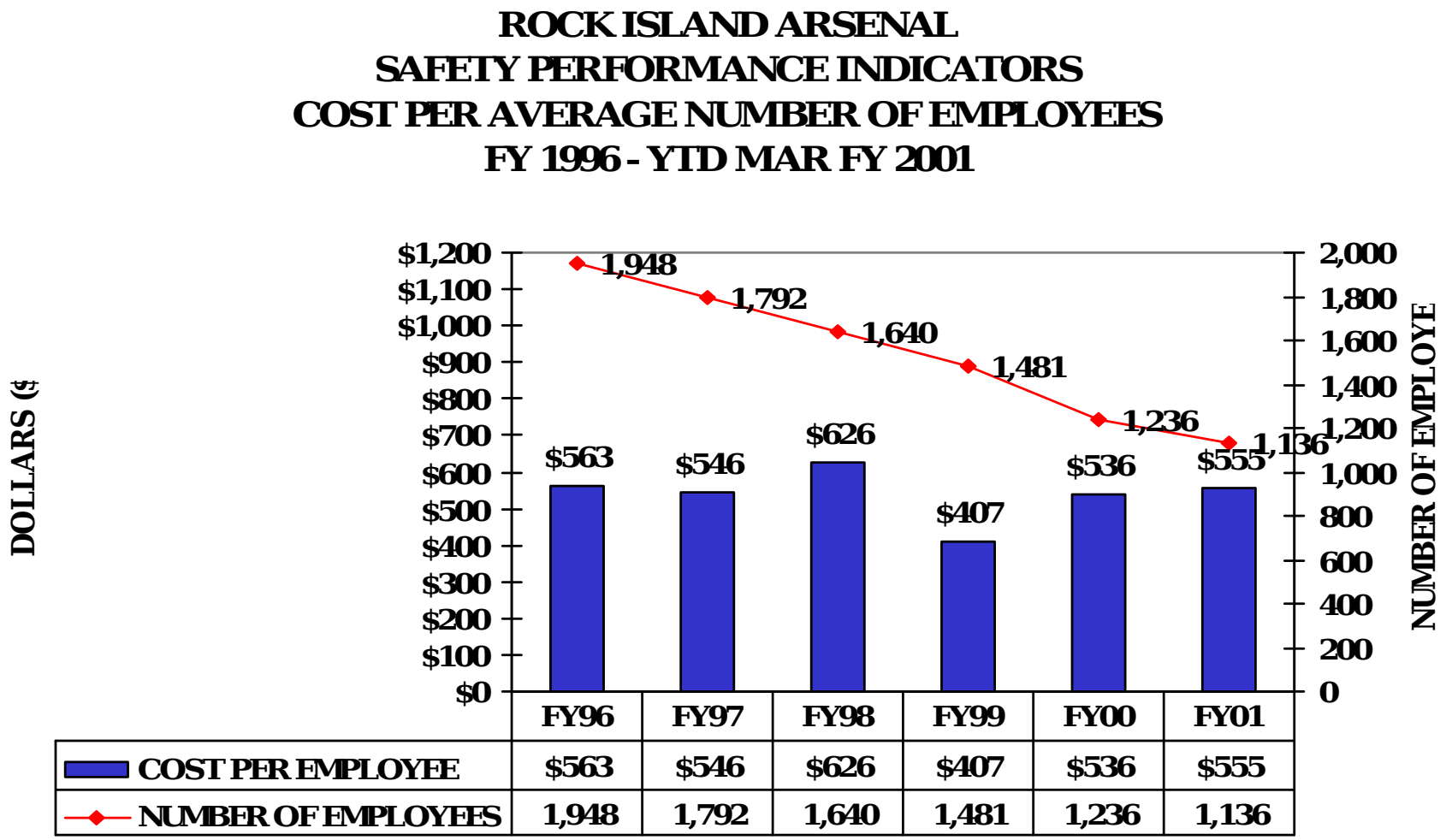


	MEDICAL	COMPENSATION	COP PAID	TOTAL
FY 96	$372,365	$700,460	$24,767	$1,097,591
FY 97	$225,005	$721,323	$32,069	$978,397
FY 98	$217,401	$800,899	$8,995	$1,027,294
FY 99	$79,867	$496,298	$27,297	$603,462
FY 00	$150,208	$496,802	$15,033	$662,042
FY 01	$170,179	$422,959	$37,840	$630,978
ACCUMULATED	$1,215,024	$3,638,741	$146,000	$4,999,765

Cost Avoidance



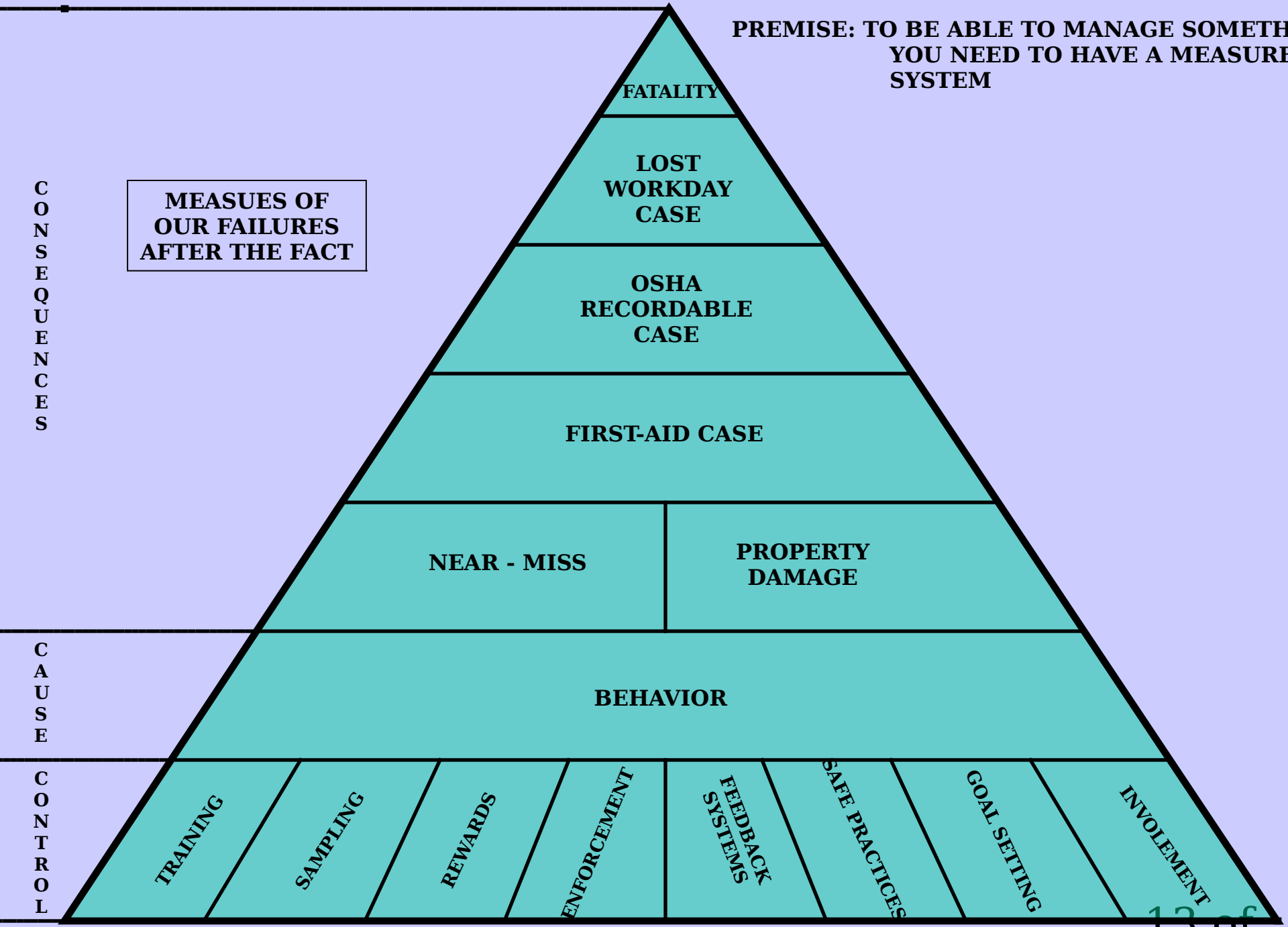
Cost Per Employee



Status of Computer Based Safety Training

Jerry Golden
SMARI-SF
DSN 793-1380
goldenj@ria.army.mil

PREMISE: TO BE ABLE TO MANAGE SOMETH
YOU NEED TO HAVE A MEASURE
SYSTEM



Computer Based Safety Training Time Line

- **FY 2000**
  - Contact Current Army User – Tobyhanna Army Depot
- **FY 2001**
  - Beta Test Group with “SMARI-IT Support”
  - Purchase CBT Programs at Reduced Cost
    - 7 CDs for the Cost of 4 CDs
  - Attend Software Provider Conference
  - Visit Established User – University of Iowa
  - Communicate Training Initiative with Customers
    - “Seek Buy-In at All Levels”

Computer Based Safety Training Time Line

- **FY 2002**
  - Select Customer Beta Test Group
  - Conduct Feed Back Sessions with Beta Test Group
  - Make Program Modifications
  - Report / Publish Successes
  - Complete Value Engineering (VE) Study
  - Provide Services to Customers
  - Continually Evaluate Performance

Safety After Accident Review

Charles Cook
SMARI-SF
DSN 793-1380
cookc@ria.army.mil

SAARs Completed YTD JUL FY 2001

- **96 Total Injury/Illness**
  - **11 Lost Time**
  - **45 OSHA Recordable**
  - **51 First-Aid**
- **8 Property Damage**

Purpose of Safety After Accident Review (SAAR)

- Thoroughly investigate an accident or injury immediately after it occurs.
- Not place blame or find fault.
- Develop and initiate effective corrective action(s).
- Share information with other organizations having similar operations.

Incident # 1

- **Job Title: Machinist**
- **Division: 62000 SMARI-ESP, Production Engineering & Prototype Division**
- **Incident Type: First-Aid**
- **General Task: Routine Operations**
- **Specific Activity: Walking**
- **Location: Bldg. 208, 1st Floor**

Description of Incident #1

- **1st Employee:**
  - **New to operation.**
  - **Removed chip conveyor grate from floor opening.**
- **2nd Employee, who was injured:**
  - **Stepped into floor opening.**
  - **Fell against machine way cover.**
  - **Received lacerations to his right hand.**

Equipment / Tools / Material or Environmental Conditions Contributing to Incident #1

- Large volume of chips produced.
- Chips catch on grate.
- Floor grate not replaced at end of shift.
- Building lights off to conserve energy.

Unsafe Work Practices Contributing to Incident #1

- **1st Employee did not reinstall floor grate.**

Corrective Actions Taken #1

- Machinist(s) cautioned to replace floor grate(s).
- Place CAUTION tape around open holes.
- Initiate actions to purchase shop vacuum.
- Initiate work order to install rods in duct opening.

Area Where Accident Occurred

Floor Opening Above Conveyor

Grate Installed Over Conveyor Opening

Incident # 2

- **Job Title: Machinist**
- **Division: 59200 SMARI-ICL, Rotational Machining Division**
- **Incident Type: OSHA Recordable**
- **General Task: Machine Operations**
- **Specific Activity: Reaching for Tool**
- **Location: Bldg. 220, 1st Floor Craneway**

Description of Incident #2

- Tall sharp tooling placed in front of storage rack.
- Employee reached over sharp tooling to get a tool.
- Employee's right forearm came in contact with a center drill.
- Employee received laceration – required 8 stitches.

Equipment / Tools / Material or Environmental Conditions Contributing to Incident #2

- **Tall sharp tooling placed in front of storage rack.**

Unsafe Work Practices Contributing to Incident #2

- **Employee reached over sharp tooling.**

Corrective Actions Taken #2

- **Employee was instructed to:**
  - **Place tall sharp tooling at rear of tool storage rack.**
  - **Not reach over sharp tooling.**
  - **Cover sharp tooling in storage rack.**

Corrective Actions Taken #2

- **SMARI-ICL Division Chief contacted SMARI-ICN Division Chief to discuss placing protective covers over all sharp tooling issued from SMARI-ICN.**

Tooling Uncovered

Tooling Covered

Incident # 3

- **Job Title: Machinist**
- **Division: 59600 SMARI-ICK, Weld & Sheet Metal Division**
- **Incident Type: OSHA Recordable**
- **General Task: Machine Operations**
- **Specific Activity: Positioning Part in Fixture**
- **Location: Bldg. 212, Weld Shop**

Description of Incident #3

- 2 Employees manually lifted OSV wrapper onto stress-relief fixture.
- Employee pinched left index finger between part and fixture.
- Employee's finger lacerated - required 8 stitches.

Equipment / Tools / Material or Environmental Conditions Contributing to Incident #3

- Large free formed aluminum part.
- Part weighed more than 100 lbs.
- Stress relief fixture.
- Inherent pinch points.

Unsafe Work Practices Contributing to Incident #3

- **None.**

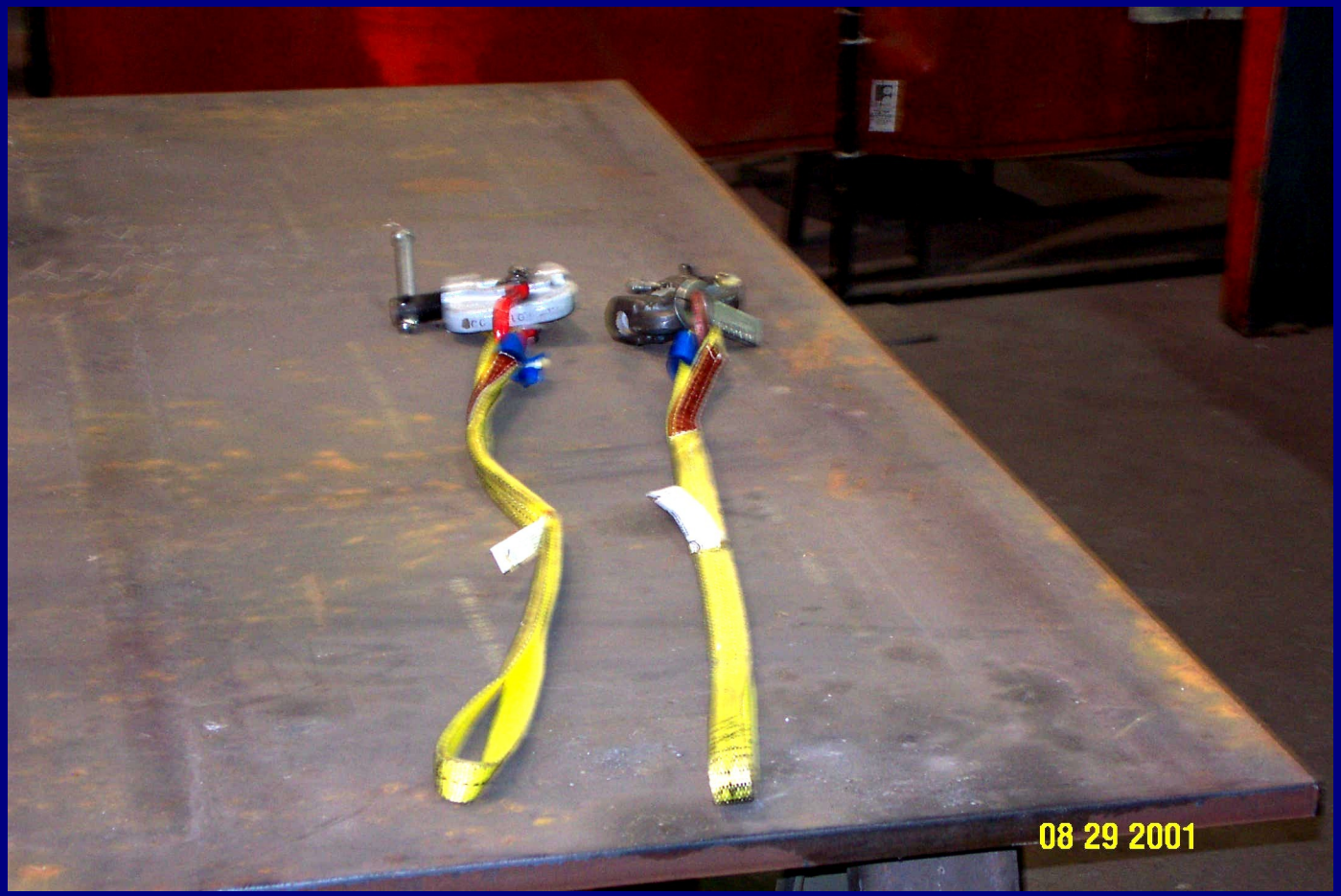
Corrective Actions Taken #3

- SMARI-ICK, ICO, ICF, ICY, and Safety personnel observed installation of large OSV wrapper on stress-fixture.
- SMARI-ICK personnel viewed training video how to load OSV wrapper on stress-relief fixture.
- SMARI-ICR-CRREP fabricated 2 lifting devices.
- Use overhead hoist to place OSV wrapper on stress-fixture.

OSV Wrapper On FIXTURE

Cams Removed

Lifting Devices For OSV Skin



Incident # 4

- **Job Title: Machinist**
- **Division: 59400 SMARI-ICH, Prismatic Machining Division**
- **Incident Type: First-Aid**
- **General Task: Machine Operations**
- **Specific Activity: Gauging a Part**
- **Location: Bldg. 208**

Description of Incident #4

- Employee manually lifted, carried, and held gauge.
- Gauging position - Arms extended away from body.
- Employee strained lower back.

Equipment / Tools / Material or Environmental Conditions Contributing to Incident #4

- Vertical turret lathe.
- Fixture 42” above floor.
- Gauge weight 44 lb.

Unsafe Work Practices Contributing to Incident #4

- **None.**

Corrective Actions Taken #4

- **Quick Fix - Use overhead crane and sling to move gauge to/from part.**
- **Investigate obtaining lighter gauge.**

Thread Go-Gauge

Fixture On VTL

Part In Fixture

Crane Placing Gauge

Gauging Part

Fire In Dust Collector

Charles Massey
SMARI-ICY
DSN 793-1380
masseyc@ria.army.mil

Definition

- **Dust Collector:**
  - **A device or combination of devices for separating dust from the air handled by an exhaust ventilation.**
  - **Prevent harmful dust exposure to employees.**

Dust Collector Fire

- **Occurred: 12 Jun 2001, 0826**
- **Location: Building 220, middle wing**
- **Machine: American Air Filter Opti-Flo Dust Collector, RIA 33419 Pulsating Type**

What Happened

A machinist and welder were working in the middle wing. They heard a booming noise and saw flames coming from the dust collector. The machinist called the fire dept. directing them to the scene. An inspector located at the entrance of the wing initiated the building fire alarm. The supervisor of the machining area ensured that all personnel in the wing evacuated. Three maintenance personnel located in the basement below heard the explosion and went to investigate. When they arrived and saw no personnel they shut down all the equipment and left. All

AAF

WARNING
BANCROFT
ON
Water
Gas
Pump
Air Shaker

06 18 2001

Outside Ducting

Dust Collector Listing

Dust Collector Listing

1. SMARI-IC Dust Collectors. All RIA numbers have been verified against Equipment File Inquiry.

Bldg 208---SMARI-ICJ

Type	RIA Number	Filter Type	Exhaust Vent Inside/Outside	C/C	Process	Tech Data
Mechanical	23813	Tube	inside	9521	blast room	AWL015
Pulsating	33261	Canister	Inside	9524	blast room	CBS002
Manual Mech	26481	Envelop	inside	9524	blast room	NONE
Mechanical	26053	Tube	inside	9524	blast room	AWL010
inoperative	33615	Canister	outside	9520	299 Blast	NONE
Bldg 212---SMARI-ICK						
Pulsating	32054	Tube	outside	9622	storage room	AAF003
Pulsating	32334	Canister	outside	9610	work room	FND001
Pulsating	32998	Canister	outside	9610	overlay	NONE
Pulsating	33427	Tube	outside	9610	blast room	NONE
Mechanical	32057	Tube	outside	8100	rotary blast	AAF001
Mechanical	32059	Tube	outside	8100	grind	AAF001
Bldg 212---SMARI-ICG						
Pulsating	32612	Tube	outside	8303	wood	NONE
Pulsating	32575	Tube	outside	8301	coating	NONE
Pulsating	32577	Tube	outside	8301	vacuum	LSC001
Pulsating	32586	Canister	outside	8301	new sand	NONE
Pulsating	32608	Canister	outside	8301	reclaim sand	NONE
Pulsating	33476	Canister	inside	8301	furan sand	NONE
Pulsating	33475	Canister	inside	8301	vent sand	NONE
Pulsating	*33474*	Canister	*inside*	*8301*	*vent sand*	*NONE*
Pulsating	32571	Canister	inside	8301	mold line	NONE
Pulsating	33477	Canister	inside	8301	mold line	NONE
Pulsating	33478	Canister	inside	8301	mold line	NONE
Pulsating	33479	Canister	inside	8301	mold line	NONE
Pulsating	32588	Tube	outside	8301	hopper mez.	MAC001
Pulsating	32391	Tube	outside	8301	5 ton furnace	RFL001
Pulsating	32392	Tube	outside	8301	3 ton furnace	RFL001
Pulsating	33022	Canister	outside	8301	Alum furnace	NONE
Mechanical	32060	Tube	outside	8301	green sand	AAF001
----------SMARI-ICG Mezzanine						
Pulsating	32594	Canister	outside	8302	grind	NONE
Pulsating	32596	Canister	outside	8302	weld	NONE
Pulsating	32597	Canister	outside	8302	air arc	NONE
Pulsating	32598	Canister	outside	8302	blasthouse	NONE
Pulsating	32063	Canister	outside	8301	weld	TRT002
Bldg 220---SMARI-ICN						
Pulsating	33399	Canister	outside	9140	grind	NONE
Pulsating	32206	Canister	outside/inside	8304	Invest	TRT001
Pulsating	32055	Tube	outside	8101	blast	AAF003
Bldg ---299						
Vacuum	17649	Vacuum	outside	5200	wood	NONE

Cause Unknown

- **Potential Causes:**
  - **Electric Arc**
  - **Static Electricity**
  - **Equipment Malfunction**
  - **Human Factor**
  - **Introduced Ignition Sources**

Electrical Arc/Static Electricity

- **The day of the fire, it was raining and humidity was high, with low potential for this type of ignition.**

Equipment Malfunction

- Monthly, Quarterly, Semi-Annual, and Annual Inspections
- Daily Operator Inspections
- New SOP is drafted and ready for Staffing

Human Factor

- Information in new SOP
- No flammables
- Operators and maintenance personnel to report misuse and abuse
- Take appropriate actions for infractions
- Training

Spark Trap

- Catch ignition sources in the intake
- In-house estimate
  - 40 hrs to manufacture ducting and install each
  - Cost $ 141.06 hour
  - Labor cost per collector $5,642.40
  - 37 collectors x 5,642.40 = $208,768.00 labor
  - Estimated cost for spark trap $500.00 to $1,000.00
  - Reduces airflow, will require initial air surveys

Deflagration Panel

- **Protect personnel from potential explosion**
  - **Rapid deflagration no explosion**
  - **Could not be estimated, unique to each dust collector**
  - **Need design approval to determine direction of blast**

Heat Sensor

- Placed in plenum, warning device
  - Sensor cost $300.00

    37 x $300 = $11,100

    *Labor 8 hrs to install cost of 141.06 per hr. in-house

    $141.06 x 8 = $1128.48 x 37 = $41,753.76 labor

Summary

- **With improved procedural controls:**
  - **Operating and maintenance controls**
  - **Operator training on the SOP procedures**
  - **Strict enforcement of the rules**
- **Additional equipment (blast doors, spark traps and heat sensors) should not be needed.**

Issues from the Council

ROCK ISLAND ARSENAL
CENTER FOR EXCELLENCE